

REMARKS/ARGUMENTS**I. Introduction**

This amendment is respectfully submitted in response to the Office Action dated July 8, 2005. The deadline for responding has been extended to January 9, 2005 (January 8 was a Sunday) by way of a request for a three month extension of time made herewith.

Claims 1-44 and 50-73 are pending. Claims 45-49 were canceled without prejudice in response to a previous restriction requirement. Claim 31 was amended in response to an objection raised by the Examiner with respect to the claim dependency while claims 3, 4, 5, 14 and 16 have been amended to address the indefiniteness rejections raised by the Examiner.

In the office action the Examiner objected to claim 31 and rejected claims 3, 4, 5, 14 and 16 under 35 U.S.C. §112, second paragraph.

In addition, the Examiner rejected all of the pending claims under 35 U.S.C. §103 for obviousness based on an Examiner proposed combination which, in the case of each of the claim rejections, depends on a combination of U.S. Patent No. 5,838,268 to Frenkel (the Frenkel patent) in view of Shattil (WO 99/41871).

As will be discussed below, the claim objections and indefinite rejections have been overcome by the amendments made herein. In addition, the applied

references, when considered alone or in combination, do not anticipate or render obvious the claimed subject matter.

**II. The Objection to Claim 31 and  
Indefinites Rejections Have Been Overcome**

In the Office Action the Examiner objected to claim 31 indicating that it should depend from claim 30 instead of claim 1. Applicants have amended claim 31 so that it now depends from claim 30 as suggested by the Examiner. Accordingly, it is submitted that the objection has been overcome. Applicants thank the Examiner for the suggestion with regard to claim 31.

In the Office Action the Examiner rejected claims 3, 4, 5, 14 and 16 under 35 U.S.C. §112, second paragraph for the reasons set forth in the Office Action. Applicants have amended each of these claims to address and overcome the Examiner's indefiniteness rejections. As amended, it is respectfully submitted that claims 3, 4, 5, 14 and 16 are definite and that the rejection of these claims under 35 U.S.C. §112, has been overcome.

**III. The Rejections Under  
35 U.S.C. §103 Should be Withdrawn**

Each of the rejections under 35 U.S.C. §103 depends on an Examiner proposed combination of the Frenkel patent and the Shattil reference. The additional references used in rejecting some of the claims in combination with these references do not make up for the deficiency of

these references and therefore will not be discussed further herein.

Pending claim 1 recites as an element:

**an interpolation circuit that receives the discrete signal and generates a continuous signal by applying an interpolation function to the discrete signal, the interpolation function operating on the discrete signal such that a frequency response of the continuous signal includes sinusoids having non-zero values at a first set of tones, the first set of tones being a subset of said multiple tones, the non-zero value at each of said first set of tones being a function of a plurality of mapped symbols corresponding to different discrete points in time, the frequency response of the continuous signal also including zero values at a second set of tones, the second set of tones being different from said first set of tones and being another subset of said multiple tones.**

In rejecting claim 1 and the Examiner first cites the Frenkel patent but acknowledges deficiencies with respect to the Frenkel patent stating:

Frenkel fails to fully disclose a frequency response of the continuous signal includes sinusoids having non-zero value at each of said first set of tones being a function of a plurality of mapped symbols corresponding to different discrete points in time, the frequency response of the continuous signal also including zero values at a second set of tones, the second set of tones being different from said first set of tones and being another subset of said multiple tones. In the same field of endeavor, Shattil discloses frequency response of the continuous signal includes sinusoids having non-zero values at each of said first set of tones, the first set of tones being a subset of said multiple tones, the non-zero value at each of said first set of tones being a function of a plurality of mapped symbols corresponding to different discrete points in time, the frequency

response of the continuous signal also including zero values at a second set of tones, the second set of tones being different from said first set of tones and being another subset of said multiple tones (**Fig. Ref 20 functions as an interpolation circuit because it combines the phase shifted carriers to produce one or more information modulated pulses centered at the predetermined instants in time.** Multiple pulses may be distributed throughout each data symbol interval. The frequency response of the pulses includes sinusoids). (Office Action page 4, bold and underlining added for emphasis)

The Examiner rejection of all the pending claims appears to based on the Examiner's above stated interpretation of the Shattil reference element 20 operating as an interpolator. However, with regard to claims 50 and 67 the Examiner later cites element 20 of the Shattil reference as performing a mapping function (see page 5, line 4 of the Office Action) which is also not accurate.

A review of the Shattil reference shows that element 20 is neither an interpolator circuit nor a mapping circuit. Element 20 of the Shattil reference is described as "a combining system" NOT an interpolator. The reference states on page 5, line 9,

The gain-adjusted CIMA signals **are summed by a combining system 20.**

A review of Figs 1 and 2 of the Shattil reference shows element 20 drawn as a box with a summing symbol in it. Applicants can find nothing in the reference that suggests that element 20 of the applied reference does anything more than sum the signals supplied to it to

combine them. That is, Applicants have been unable to find anything that describes element 20 as an interpolator or that it does something beyond summing the signals supplied to it to combine them.

Accordingly, since element 20 of the Shattil reference is NOT an interpolator, combining it with the Frenkel patent as the Examiner suggests would not make up for the numerous Examiner recognized deficiencies of the Frenkel patent with respect to the interpolator circuit and/or interpolation function recited in various claims.

Applicants further submit that since element 20 does NOT perform the same function as the interpolator 30 of the Frenkel patent one of ordinary skill in the art would not be motivated to use it in place of the Frenkel interpolator 30 and, furthermore, the Examiner has failed to suggest how such a proposed combination would improve upon the Frenkel system. Since the components do not perform the same function and there is no clear reason to use the combining system 20 of Shattil reference in place of the interpolator 30 of Frenkel, or that such a change would even work, it is respectfully submitted that the Examiner proposed combination of references is improper and the rejection based on the combination should be withdrawn for this additional reason as well.

In view of the above remarks, it should be appreciated that element 20 of the Shattil reference is NOT an interpolator but rather a combining circuit, e.g., a summer, and that all of the Examiner's rejections which are based on element 20 being an interpolator should be

withdrawn. Since the rejection of all of the pending claims are based on the Shattil patent and the other references fail to make up for the above noted deficiencies of the Shattil patent, the rejection of the all the pending claims should be withdrawn.

**IV. Request for Clarification**

If the Examiner seeks to maintain any of the outstanding prior art rejections Applicants request that the Examiner clarify the rejection by clearly indicating which elements of the Frenkel patent the Examiner would replace with elements of the Shattil reference and indicate what the advantage of the replacement would be. Is the Examiner suggesting replacing the interpolator 30 or mapper 10 with the combining system 20 of the Shattil reference? If the Examiner is not suggesting such a modification but still thinks some combination is obvious, what precise combination is the Examiner proposing in terms of actual elements described in the references.

Applicants respectfully submit that such information is needed if Applicants are to be given a full and fair opportunity to address the merits of any rejection based on the Examiner proposed combination of references.

**V. Conclusion**

In view of the foregoing amendments and remarks, Applicants respectfully submit that the pending claims

are in condition for allowance. Accordingly, Applicants request that the Examiner pass this application to issue.

If there are any outstanding issues which need to be resolved to place the application in condition for allowance **the Examiner is invited to contact Applicant's undersigned representative by phone to discuss and hopefully resolve said issues.** To the extent necessary, a petition for extension of time under 37 C.F.R. 1.136 is hereby made and any required fee is authorized to be charged to the deposit account of Straub & Pokotylo, deposit account number 50-1049.

Respectfully submitted,

January 9, 2005

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**CERTIFICATE OF FACSIMILE TRANSMISSION**

I hereby certify that this paper (and any accompanying paper(s)) is being facsimile transmitted to the United States Patent Office on the date shown below.

Michael P. Straub

Type or print name of person signing certification

Michael P. Straub  
Signature

January 9, 2005

Date